

NOTE

First Host Plant and Parasitoid Record for *Anastrepha spatulata* Stone
(Diptera: Tephritidae)

Anastrepha spatulata Stone has been reported in the U.S. (S. Texas), Mexico, Central America (Guatemala S. to Panamá), Venezuela and Tobago (Norrbom et al. 1999. *Myia* 9: 65–251 [p. 82 for *A. spatulata*]). In Mexico, it is commonly captured in McPhail traps placed in commercial fruit orchards (Aluja et al. 2000. Proceedings of the Entomological Society of Washington 102: 802–815). In the past 60 years, there have been considerable, but until now unsuccessful, efforts to discover its host plant. This species, together with *A. alveata* Stone, *A. alveatoides* Blanchard, *A. distans* Hendel, *A. interrupta* Stone, *A. manihoti* Lima, *A. montei* Lima, *A. pickeli* Lima, and *A. umbrosa* Blanchard, form the *spatulata* species group (Norrbom et al. 2000. pp. 343–362. In Aluja and Norrbom, eds., *Fruit Flies* (Diptera: Tephritidae): Phylogeny and Evolution of Behavior, CRC Press).

We report here on *A. spatulata* infestations in *Schoepfia schreberi* Gmelin fruit (Olacaceae). This bushy plant is locally known in Veracruz as “guayabillo” or “palo meco.” Fully ripe fruits measure, on the average, 1.92 ± 0.06 cm (diameter, $n = 25$) and weigh 185 ± 0.061 mg ($n = 25$). A mature plant measures ca. 2.10 m in height. Floral buttons of *S. schreberi* were observed from January 20th to February 5th. The flowering period was recorded from the 1st to the 12th of February and the fruiting season occurred between the 10th and the 20th of February (all during 1998). Fly larvae were always found feeding in the seed of the fruit (there is one seed per fruit). There was always only one larva per fruit. Given the small size of the host, fully mature larvae, 8.6 ± 0.12 mm ($n = 8$) in length, looked very compressed inside the host. We collected 3 batches (different

collection dates) of ripe fruit from the ground adjacent to four *S. schreberi* bushes. A total of 583 g of fruit were collected on February 2, 9, and 18, 1998. Fruit was handled as described by Aluja et al. (2000). Pupae were harvested between 1 and 6 days after the fruit collecting date. The 583 g of fruit yielded 579 pupae (0.993 pupae/g of fruit). Mean pupal weight was 12 ± 0.001 mg ($n = 13$). We divided pupae into two batches. One was kept under field conditions and another was transported to the laboratory. The collection site was Llano Grande, Municipio de Teocelo, Veracruz, Mexico, at 720 m altitude ($19^{\circ}22'N$ and $26^{\circ}53'W$). Native vegetation around this site is a tropical deciduous and subdeciduous forest (Castillo-Campos. 1995. *Ecología del Paisaje del Municipio de Jalcomulco*, Veracruz, MS Thesis, UNAM, Mexico City).

Between February 29 and March 5, 454 *A. spatulata* adults (223 females, 231 males), 17 *Doryctobracon areolatus* (Szepilgeti) (10 females, 7 males) and 2 *Doryctobracon toxotrypanae* (Muesebeck) (2 females) emerged. We note that the *D. areolatus* individuals emerging from *A. spatulata* were uniformly more darkly colored than those individuals of the same species, parasitizing, in the same region, *A. alveata*, *A. obliqua* (Macquart), *A. striata* Schiner and *A. fraterculus* (Wiedemann) (Lopez et al. 1999. *Biological Control* 15: 119–129). Length of the pupal period for flies was 22 ± 3 and 27 ± 9 days under laboratory and field conditions, respectively (mean temperature of $26 \pm 1^{\circ}C$ and $23 \pm 3^{\circ}C$ under laboratory and field conditions, respectively). In the case of the parasitoids, the length of the pupal period for *D. areolatus* was 25 ± 9 and 26 ± 5 days under laboratory and

field conditions, respectively (same temperature conditions as flies). For *D. toxotrypanae* it was 21 days (laboratory conditions only). Another 9 *D. areolatus* (8 females, 1 male) entered diapause and emerged after ca. 11 months (range of 308–341 days). Diapause by *D. areolatus* in the same region has been recently reported by Aluja et al. (1998. *Annals of the Entomological Society of America* 91: 821–833).

Schoepfia schreberi had been previously reported as a host plant of *A. interrupta* (McClanahan. 1951. *State Plant Board of Florida Biennial Report No. 18*, p. 44; as *S. chrysophylloides*). Interestingly, the host plant of another fly belonging to the same species group (*A. alveata*), also belongs to the family Olacaceae (Piedra et al. 1993. *Proceedings of the Entomological Society of Washington* 95: 127). Based on the few host records for the *spatulata* group (Norrbon. 2000. *Diptera Data Dissemination Disk 2, in press*), it appears that flies in this assemblage of species are specialized on only two plant families, Olacaceae and Euphorbiaceae.

Our discovery of *D. toxotrypanae* parasitizing a species of *Anastrepha* is noteworthy since this parasitoid had been previously reported parasitizing only *T. curvicauda* Gerstaecker (Wharton and Marsh. 1978. *Journal of the Washington Academy of Sciences* 68: 147–167). *Toxotrypana curvicauda* is common in the study region where it has been recently reported infesting *Gonolobus niger* (Cav.) R. Br. (Asclepiadaceae) fruit (Aluja et al. 2000). It is thus likely that the *D. toxotrypanae* individuals parasitizing *A. spatulata* stemmed from parasitized *T. curvicauda*. We note, however, that *D. toxotrypanae* is only distinguished from *D. crawfordi* on the basis of color differences (*D. toxotrypanae* is darker) (R. A. Wharton, pers. comm.). Based on

the latter, the question remains open as to which of the two above mentioned *Doryctobracon* species was actually parasitizing *A. spatulata* in our study region.

Voucher specimens of *S. schreberi* and *A. spatulata* are placed in the herbarium and insect collection of the Instituto de Ecología, A.C. in Xalapa, Veracruz, Mexico. *Anastrepha spatulata* individuals were also sent to the National Museum of Natural History, Washington, DC (A. L. Norrbom) and *D. areolatus* and *D. toxotrypanae* individuals were sent to the parasitoid collection of Texas A&M University, College Station, TX (R. A. Wharton).

Specimen identification was by the following: *A. spatulata* (A. L. Norrbom, Systematic Entomology Laboratory, ARS, USDA, % National Museum of Natural History, Washington, DC); *D. areolatus* and *D. toxotrypanae* (Robert Wharton, Texas A & M University, College Station), and *Schoepfia schreberi* (Carlos M. Durán-Espinoza, Instituto de Ecología, A.C., Xalapa, Veracruz, Mexico). Financial support was provided by the Campaña Nacional contra las Moscas de la Fruta, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO) (Grant No. H296), Sistema Regional de Ciencia del Golfo (CONACyT-SIGOLFO) (Grant No. 96-01-003-V) and the U.S. Department of Agriculture (ARS, USDA) (Grant Numbers 198-23 and 58-6615-3-025).

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